ATTACHMENT 1

Request No. 1:

Provide the date of the most recent reline for each furnace 4, 6, and 8. For each most recent furnace reline, provide narrative description of the changes made to the furnace, explaining the difference in refractory, controls or any other change that was not an exact replacement in kind. Provide the production from each furnace for the 4 years prior to the most recent reline and 4 years after the most recent reline, in tons of hot metal per hour.

U. S. Steel Response:

#4 Blast Furnace Reline was performed during the 1st quarter 1990. The following tasks were performed during the reline. Repairs were either an exact replacement or an improved replacement in kind. Items that were not an exact replacement were projects to improve the cooling and refractories of the Blast Furnace to improve reliability, extend campaign life, and reduce require repairs during a reline. The use of alumina and SIC refractories as replacement refractory improved the protection, durability and reliability of the Blast Furnace

a. A new graphite cooled carbon hearth with ceramic plug which provides better cooling to the hearth and re-brick the bosh area with SIC refractory. SIC refractory was used to achieve greater longevity of the refractories.
b. Improvements to the bosh channel cooling system by increasing water velocities through the cooling system which improve the longevity of the bosh.
c. Increase the cooling plate density in the lower stack; add cooling plates in the upper stack region to increase hear removal.
d. Rebrick the stack with high alumina refractory and SIC in the lower stack region.
e. Replace shell plates in kind as required and provide access for remote control gunning device.
f. Installation of a back draft stack to reduce wear on stoves. Back drafting the furnace occurred through the stoves prior to the installation of the back draft stack.
g. Repair of the existing gas system and gas cleaning system.
h. Stove inspection and repair in kind.
i. Remove and rehabilitate top machinery.
j. Stockhouse inspected and repaired in kind.
k. Since reline outage was postponed for 1 year, the following items were added to the reline scope: Additional stack shell replacement, bustle pipe refractory and shell repair, skip bridge repair, offtake, uptake, and downcomer lining, replacement of coke vibrating feeders, additional stove checker replacement, and install swinging iron runner in the casthouse.

Production data in tons of hot metal per hour are not available. Listed below are the total tons produced for the four calendar years before and after the reline.

Units – tons / year, R – Reline Year

1986	1987	1988	1989	1990(R)	1991	1992	1993	1994
348,000	585,000	953,912	660,930	1,039,507	1,325,123	1,308,218	1,155,200	1,205,295

#6 Blast Furnace Reline was performed during the 3rd quarter 1998. The following tasks were performed during the reline. Repairs were either an exact replacement or an improved replacement in kind. Items that were not an exact replacement were projects to improve the cooling and refractories of the Blast Furnace to improve reliability, extend campaign life, and

Table 12.5-1 (cont.).

Source	Units	Emission Factor		EMISSION FACTOR RATING	Particle Size Data
Blast furnace					
Slip	kg/Mg (lb/ton) slip	39.5	(87.0)	D	
Uncontrolled casthouse	kg/Mg (lb/ton) hot metal				
Roof monitor[b]		0.3	(0.6)	B	Yes
Furnace with local evacuation[c]		0.65	(1.3)	B	Yes
Taphole and trough only (not runners)		0.15	(0.3)	B	
Hot metal desulfurization	kg/Mg (lb/ton) hot metal				
Uncontrolled[d]		0.55	(1.09)	D	Yes
Controlled by baghouse		0.0045	(0.009)	D	Yes
Basic oxygen furnace (BOF)					
Top blown furnace melting and refining	kg/Mg (lb/ton) steel				
Uncontrolled		14.25	(28.5)	B	
Controlled by open hood venter to:					
ESP		0.065	(0.13)	A	
Scrubber		0.045	(0.09)	B	

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January 7, 2008

VIA FEDERAL EXPRESS OVERNIGHT DELIVERY

Attn: Compliance Tracker, AE-17J
Air Enforcement and Compliance Assurance Branch
U.S. Environmental Protection Agency
Region 5
77 West Jackson Boulevard
Chicago, IL 60604

Dear U. S. EPA Region V Representative:

On or about November 9th, United States Steel Corporation (U. S. Steel) received a Clean Air Act Section 114 Request for Information. On December 7, 2007, U. S. Steel provided responses to the Request. As noted in our December 7, 2007 response and as indicated in the December 4, 2007, telephone conversation between David Hacker of U. S. Steel and Brian Dickens of U.S. EPA Region V, U. S. Steel indicated that it would supplement the response no later than January 8, 2008. This correspondence and attachments serve as that supplemental response. A certification page is provided immediately prior to the attachments.

Consistent with our prior responses, please note for organizational purposes, regardless of the length of the response, U. S. Steel's response to each inquiry is provided as a separate attachment so that the attachment number will correlate to the original request number.

1. Provide the date of the most recent reline for each furnace 4, 6, and 8. For each most recent furnace reline, provide narrative description of the changes made to the furnace, explaining the difference in refractory, controls or any other change that was not an exact replacement in kind. Provide the production from each furnace for the 4 years prior to the most recent reline and 4 years after the most recent reline, in tons of hot metal per hour.

Please refer to the pages behind Tab No. 1 for U. S. Steel's response to this Request.

2. Provide the emissions of hydrogen cyanide (HCN) from blast furnace operations for each blast furnace. Provide a narrative description of how U. S. Steel calculated or measured these emissions.

Please refer to the pages behind Tab No. 2 for U. S. Steel's response to this Request.

ATTACHMENT 6

Request No. 6:

Provide the increase in emissions of sulfur dioxide from the blast furnace casthouse and all emission units that burn blast furnace gas as a result of Pulverized Coal Injection project. Provide a description of the methods U. S. Steel used to arrive at this emission increase.

U. S. Steel Response:

Changes to SO2 emissions from Blast Furnace Casthouses as a result of Pulverized Coal Injection Project cannot be determined. Pre-Pulverized Coal Injection data does not exist for Casthouse SO2 emissions. Therefore any increase or decrease to SO2 emissions cannot be determined. Testing that was performed in March 2002 was located and the results are tabled below along with an explanation of SO2 formation in Blast Furnace Casthouses at Gary Works.

The release mechanism for SO2 during the casting operations is the release and subsequent oxidation (combustion) of hydrogen sulfide (H2S) gas emitted from hot metal and slag. The H2S gas is liberated from molten iron as it exits the tap hole, enters the iron trough, flows through iron runner and drops into torpedo cars. H2S is also released from slag as it exits the tap hole. The H2S released from the hot metal and slag is burned in the presence of oxygen to form SO2 in air in regions where the air temperature is above the ignition temperature of H2S and the concentration of H2S are between the lower and upper flammability limits for H2S. In general, these conditions exist within a few inches above the molten metal or slay streams.

On March 11, 2002, stack test was conducted at the baghouse stack on #13 BF Casthouse. The results of the test are displayed in the table below.

Results of SO2 Emission Testing

Run No.	Date	Time	Duration	Casting Rate	SO2 Emission Rates	
			(min)	(tons/hr)	(lbs/hr)	(lbs/ton)
1	3/11/2002	0840-0940	60	323	137.7	0.519
2	3/11/2002	0941-1041	60	237	151.3	0.638
3	3/11/2002	1042-1142	60	194	79.2	0.408
4	3/11/2002	1143-1243	60	231	116.3	0.503
5	3/11/2002	1244-1400	76	341	40.1	0.117
Mean			**63**	**265**	**110.9**	**0.437**

The South Blast Furnaces (No, 4,6, and 8) at Gary Works are equipped with iron oxide fume suppression systems for PM10 emission control. These systems deprive the molten streams of oxygen, which suppress the formation or iron oxide fume. It is most reasonable to assume that the oxygen deprivation also suppresses the oxidation of H2S to SO2. There is no known practical and safe method of testing the emissions of SO2 from the casthouse roof monitors at the south furnaces. SO2 emissions from these casthouses are being estimated by conservatively assuming 50% suppression efficiency and assuming that the uncontrolled emission factor determined by the #13BF testing.

Changes to SO2 emissions from all emission units that burn blast furnace gas as a result of Pulverized Coal Injection Project cannot be determined. Emission units that burn blast furnace gas are: stoves for Blast Furnaces 4,6,8, & 13/14, No. 4 BoilerHouse, and Turbo Blower Boilers